



ARMY SERVICE FORCES  
UNITED STATES ENGINEER OFFICE  
MANHATTAN DISTRICT  
OAK RIDGE, TENNESSEE  
P.O. Box 8

IN REPLY  
REFER TO

RIDGM-2  
MD-6 as. 913

PHG 45,547  
L... 215

21 March 1945

Subject: Incident of 1 February 1945.

MEMORANDUM to the Files (u)

REPOSITORY  
COLLECTION  
BOX NO.  
FOLDER

*Oak Ridge Operations  
Records Building Center*

*Doc # 45,547*

*PHG Box # 215*

*HRE: 45*

1. This incident occurred, according to those involved, at approximately 1610 1 February 1945. At this time the rupture disk of the safety valve on a storage tank in transfer room #2 of the operations building gave way under the pressure of material within.

2. "Material" vapor immediately filled this room and control room #2, and was soon quite dense throughout the entire north end of the building according to witnesses. Some of the vapor fumes reached as far as transfer room #7 located about two-thirds of the way down the building.

3. The vapor was very dense in the area immediately surrounding transfer room #2 for 5-7 minutes. During this interval emergency measures were taken to clear the vapor from the building.

4. A number of workers were in the building at the time but most of those not directly concerned with operation or supervision of the immediate area left the building at once.

5. Twenty-two men were sufficiently affected by the incident to report to First Aid at the plant. Nineteen of these were sent to the dispensary for further care or observation. Two of these nineteen were hospitalized at the main hospital while several others were kept overnight for observation at the dispensary. At the time of this report, one of the men is still hospitalized.

6. At the time of the break approximately 450 pounds of "material" escaped. Material vapor was cleared from the building by blower ventilation, and at least three of the men involved received their exposures while working in a ditch outside of the building near one of the vent outlets. All others seen at First Aid or the dispensary were inside the building at the time.

7. There were no immediate fatalities and at the present time no reason for feeling that any fatality will occur. A detailed case history of the men hospitalized will be reported separately. (See later report on [REDACTED]).

Classification Changed to UNCLASSIFIED

By Authority of DA R-1  
Classification Authority

By R. B. Martin, Analyses Corp. 11-31-90  
Date

*T. Davis 12-7-90*

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ChemRisk Document No. 2510

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Subject: Incident of 1 February 1945.

21 March 1945

8. Resume of Symptoms

- a. Seven of the men examined complained of varying degrees of burning of the eyes, face, and chest.
- b. Two complained of burns of the hands and wrists.
- c. Seven men gave a history of sore throat lasting from one to seven days after the incident.
- d. Six men complained of cough either as their only symptom or as a secondary symptom to one of the above.
- e. Six men also complained of chest pain which varied from immediate to prolonged pain.
- f. One man complained of a generalized rash over the body immediately before taking a shower.
- g. Another complained of a "feeling of tightness" in both eardrums.
- h. Another complained of a burning sensation in the nose.
- i. Another gave the complaint of dizziness for two hours afterward.
- j. Two men complained of an unpleasant odor and taste which persisted until the next day.

9. Findings at first aid or dispensary

- a. Pales in the chest--5 men.
- b. Conjunctivitis--6 men.
- c. Infection of pharynx--6 men.
- d. First degree burns
  - (1) Face--4 men
  - (2) Ears--1 man
  - (3) Hands 1 man.
- e. Severe collapse--1 man.

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Subject: Incident of 1 February 1945.

21 March 1945

10. Diagnoses made in dispensary.

- a. Chemical conjunctivitis--6 men.
- b. Chemical bronchitis--6 men.
- c. Chemical pharyngitis--4 men.
- d. Chemical burns (1st degree)--4 men.
- e. Chemical stomatitis--1 man.
- f. No findings--7 men.
- g. Pulmonary edema and collapse--1 man.

11. Resume of disability.

- a. One man ( )--5 days.
- b. One man ( )--35 days at present, future undetermined.
- c. One man ( )--5 days.

Four other men were detained at the dispensary overnight but were released before their next regular shift (2 February 1945).

12. Laboratory findings.

a. Blood examinations.

(1) RBC counts of six men showed transient reduction in three cases over a period of five days.

(2) Hgb reports showed a similar slight reduction.

(3) WBC showed a definite increase in day of incident or day following in four of six cases. The initial counts ranged from 4,000 to 16,500. In all but one case, the RBC count returned to normal in five days, where repeat counts were taken (five cases).

(4) Differential counts showed normal reaction to the increased white cell count with only one case showing a slightly increased number of lymphocytes. No unusual blood cell forms were seen.

b. Urine examinations.

(1) At least one urine examination was obtained from twelve of the men involved. Repeated urine examinations were obtained on ten of the men involved.

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Subject: Incident of 1 February 1945.

21 March 1945

(2) Specific gravity varied within normal range and no outstanding correlation was obtained between these figures and the time after the incident.

(3) Albumin: one report of one plus on day of incident--cleared by next day. One report of trace on day of incident--cleared by next day. Otherwise all reports were negative except in the case of ( ) to be reported separately.

(4) Sugar: entirely negative except for two instances. One plus on 5 February 1945--clear by next sample. Slight trace on 6 February 1945--clear by next day.

(5) Microscopic: negative in all cases except for amorphous sediment in one case on the day of the incident.

(6) Chemical analyses for T in urine.

| Initials | 2-1-      | 2-2       | 2-3     | 2-4 | 2-5  | 2-6  | 2-7  | 2-8 | 2-9 | 2-10 |
|----------|-----------|-----------|---------|-----|------|------|------|-----|-----|------|
|          | .06 mg/l  | -         | -       | -   | -    | -    | -    | -   | -   | -    |
|          | -         | 0.13 mg/l | 0.25    | 0.  | 0.   | -    | 0.   | -   | -   | -    |
|          | 0.5 mg/l  | .0.06     | -       | 0   | 0.   | -    | 0.13 | 0.  | -   | 0.   |
|          | -         | -         | 0. mg/l | -   | -    | -    | -    | -   | -   | -    |
|          | -         | .0.06mg/l | -       | 0.  | 0.13 | -    | 0.   | -   | -   | -    |
|          | -         | 0.5 mg/l  | 0.25    | -   | 0.5  | -    | 0    | -   | -   | -    |
|          | 0.25 mg/l | -         | -       | 0.  | -    | 0.25 | 0    | -   | -   | -    |
|          | -         | 0.13 mg/l | .06     | -   | -    | 0.13 | -    | -   | -   | -    |
|          | -         | .0.06     | -       | -   | 0    | -    | 0.   | -   | -   | -    |
|          | -         | 0.38      | -       | -   | -    | -    | 0.   | -   | -   | -    |
|          | -         | 0.5 mg/l  | -       | -   | 0    | -    | 0.   | -   | -   | -    |
|          | -         | -         | -       | -   | -    | -    | -    | 0.  | -   | -    |

- ( ) reported first to dispensary on 5 February 1945).
- No sample taken on that date.

g. Chest x-ray reports.

- |     |  |        |  |
|-----|--|--------|--|
| (1) |  | 2-2-45 | P-A view--normal   |
| (2) |  | 2-3-45 | P-A view--normal   |
| (3) |  | 2-2-45 | P-A view--normal   |
| (4) |  | 2-2-45 | P-A view--normal   |
| (5) |  | 2-2-45 | P-A view--normal   |
| (6) |  | 2-3-45 | P-A--reveals calcified mediastinal glands on the right (present at pre-employment exam). |

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Subject: Incident of 1 February 1945.

21 March 1945

13. In reviewing the location of the men involved it was found that six of them were present in control room #2 and adjoining transfer room #2 where the break occurred. One of these men [redacted] had no findings at all and his only symptoms were burning sensations of the ears, throat, and hands. He immediately left the room, got a mask, and assisted in clearing the room upon his return.

14. [redacted] obtained a mask and went to control room #2 to assist. He was present in the immediate region for ten to fifteen minutes. His symptoms included pain in the chest and burning of the ears and the wrists. The findings at the dispensary included crepitant rales throughout the chest and first degree burns of ears and wrists. He was detained at the dispensary overnight.

15. [redacted] was present in control room #2 at the time of the break. He became enveloped in the cloud of vapor and apparently lost his way trying to reach the outside. By the accounts of those who saw him, he was present in the vapor for about eight to ten minutes without a mask. His symptoms included vomiting and evidences of collapse. Findings at the dispensary included rales throughout the chest, thready pulse, marked redness of both eyes and a sort of mental confusion or apathy. He was detained at the dispensary, and as soon as his condition would permit (3 days) he was transferred to the hospital.

16. [redacted] was in transfer room #2 at the time of the accident and was the closest to the break of all those involved. He estimates that he was in heavy fumes of the vapor for about five minutes. During this time he was able to stick his head out of a window. At the end of five minutes he found a mask with one strap broken, but he wore this, nevertheless, and kept on working in the room for another ten minutes. His symptoms included cough and burning of the eyes. Examination at the dispensary revealed no rales in the chest, redness of the eyes and redness of the neck. He was detained in the dispensary overnight only.

17. [redacted] was transferring material in one of the other transfer rooms. At the time of the break he got a mask and tried to enter transfer room #2. He was told to determine if all men were out and went to several control rooms. He then left the building by way of a window. His only symptom was burning of the eyes. Findings at the dispensary showed inflammation of the conjunctiva of both eyes. He was returned to work.

18. [redacted], a janitor, was cleaning the floor in control room #2 when the vapor filled the room. He went to an open window immediately and covered his nose with a cloth part of the time. He was in the room for about fifteen minutes without a mask. His immediate symptoms were cough and substernal pain. The findings at the dispensary included no rales at first but a few scattered rales at left base later and slight injection of pharynx. He was detained in the dispensary for approximately 48 hours.

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Subject: Incident of 1 February 1945

21 March 1945

19. Eleven other men were in other parts of the building at the time and reported to First Aid or the dispensary. Since these men were in various parts of the building, they will now be considered in order of their closeness to the incident.

a. [redacted] was in transfer room #3. He went in search of a mask which he could not find. He was in several places trying to help, still without a mask, and only occasionally putting his head out the window. His symptoms were pain in the chest, cough and burning of the eyes. Examination at the dispensary after two hours of oxygen therapy failed to reveal any pulmonary findings, but redness and irritation of conjunctivae were present. He was in bed in the dispensary for 22 hours.

b. [redacted] also states he was in transfer room #3 awaiting assignment at the time. He held his breath and went to the floor below for a mask. He was not again in the vapor cloud. He had no immediate symptoms but, according to his statement, began to cough the next day. This cough persisted for seven days. He was seen at First Aid on two occasions as a welfare illness and finally, on giving above exposure history, was sent to the dispensary on 8 February 1945. His symptoms then were persistent non-productive cough, sore throat and headache. The findings in the dispensary were moist rales over large bronchi which cleared with coughing, 80 110/70, and a few moist rales at the right base. He was given cough medicine while under observation at the dispensary, and an x-ray of the chest was taken. This latter was negative for any acute lesion. He was returned to work.

c. Three men, [redacted], [redacted], and [redacted] were in either transfer room or control room #5. [redacted] found an unused mask and left the building at once. His symptoms included dry throat, burning of the nose and marked expectoration for several hours. Dispensary findings included injection of pharynx, dryness of lips and no rales in the chest. BP was 122/84. He was returned to work from the dispensary. [redacted] got a mask and went to the area of the incident to help. His only symptom was a generalized itching immediately after leaving the building. Since he was involved in a later incident the same evening, his symptoms and findings are hard to differentiate, but none seem to have been the direct result of this incident. He was kept in the dispensary overnight largely as the result of injuries from the later incident. [redacted] states he went to rack #14 and got a mask. He went to transfer room #2, masked, after seeing that other operators were out. He then proceeded to rack #10, thence to the ground level and out. He returned after visibility improved. He removed his mask, took a shower and reported to First Aid. His only symptom was a persisting sour taste. There were no findings, and he returned to work.

d. [redacted] was in control room #7. He went to get a mask but found none in control rooms 7, 6, and 5, and then he left at once. His only symptoms were headache, burning of the eyes, and a feeling of pressure in the eardrums. There were no findings, and he was returned to work.

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Subject: Incident of 1 February 1945.

21 March 1945

e. [REDACTED] was at rack #5. He saw vapor approaching and left the building. Reported to First Aid. He had no symptoms, there were no findings, and he was returned to work.

f. [REDACTED] was tending pumps around rack #5, and when he observed vapor he left the building at once. He reported to First Aid as an example to his men. His only symptoms were slight unpleasant odor, and dryness of the throat. There were no findings, and he returned to work.

g. [REDACTED] was on the top floor of the building and thought he got some vapor in his throat. His only symptom was a sore throat. The dispensary findings were those of a pharyngitis and, after three hours bed rest, he was returned to work.

h. [REDACTED] was on the steam tanks above the pumps when both this and the second incident occurred. He had no mask either time. He began to cough at 1830 and vomited once at 1900. He did not report to dispensary until 8:45 3 February 1945. His symptoms then were cough and chest pain. Findings included T. 99.2, BP 110/70 and occasional whistling rales at right base. He was kept in the dispensary 24 hours and returned to work.

i. [REDACTED] was in office of the plant on the ground level. He got a mask and went to transfer room level. He assisted generally and was present in the vapor about five minutes. He had no symptoms, there were no findings, and he returned to work.

20. From the above summary it would seem apparent that the major symptoms and findings were in those men who were not only closest to the "break" but who also remained longest in the immediate region. There seems to be a definite concentration times time correlation here, but it is difficult in some of the cases to establish it with certainty.

#### 21. Conclusions

a. This accident serves to emphasize the necessity for requiring workmen who may be exposed to carry individually fitted masks with them ready for use.

b. Masks should be donned by an employee whenever he can smell "material" or see it in his vicinity.

c. In accidents in which multiple injuries are received, treatment of eye injuries should precede any other treatment.

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Subject: Incident of 1 February 1945.

21 March 1945

d. The most important measure in treating pulmonary irritation from "material" is the administration of oxygen.

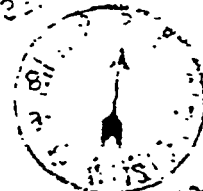
e. To date it is impossible to evaluate the significance of urinary excretion.

RICHARD W. BOWNEAGE  
1st Lt., Medical Corps

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